

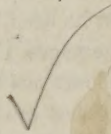
Bell (L.V.)

DISSERTATION

ON THE

BOYLSTON PRIZE QUESTION FOR 1835:

"WHAT DIET CAN BE SELECTED WHICH WILL ENSURE THE GREATEST
PROBABLE HEALTH AND STRENGTH TO THE LABORER IN THE CLIMATE
OF NEW ENGLAND? QUANTITY AND QUALITY, AND THE TIME
AND MANNER OF TAKING IT, TO BE CONSIDERED."



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ADVERTISEMENT.

I FEEL unwilling that the following pages should go to the public without a few words of explanation ;—I will not say *apology*, for their publication was made alike without my *knowledge* or *consent*. When originally written, it was thought that at some future period, when the views presented should be more systematized, and reinforced by additional facts and observations, they might not be unsuited for the press. It was, then, with surprise, not to say regret, that it was found the essay had been handed over to a medical periodical, without consulting the writer or giving him an opportunity to make such corrections and additions as seemed necessary and desirable. Under such circumstances, it only remained for him to engage the publisher of the Boston Medical and Surgical Journal (in which the publication had been made), to strike off a small edition, which “with all its imperfections on its head,” is here submitted.

On casting my eye over the pages, I am not sure but some of the expressions may be deemed discourteous towards an eminent individual of this State, whose name has been much connected with the subject of vegetable diet in New England. I would, in advance, make an utter disclaimer of reference to ought except his peculiar views on this topic, which if erroneous, as I believe them to be, are nevertheless the errors of a scientific mind and a philanthropic disposition.

L. V. B.

Derry, N. H. November, 1835.

PRIZE DISSERTATION.

THE subject of diet offers a wide scope for observation, experiment and speculation, as affecting our species in several important points. It concerns us :

1. As to our intellectual and moral existence.

The view of the relations between body and mind, their varied connections with, and reactions upon each other, presents a field of research extended and promising the richest and most interesting results to the philosophical inquirer ; a field as yet little explored, but which it does not comport with the design of our present treatise to enter, or glance upon, except as incidentally illustrating our immediate purpose. Suffice it to observe, that, as it is now the perhaps generally received opinion, that the intellectual and moral faculties, if they do not exist in, are at least dependent upon material organs, an agent possessing such decided influence upon the bodily system, as the food cannot be denied to have, must produce no less marked indirect consequences upon the mental powers.

2. In its influence upon man in his civil and political relations.

The writers on political economy, and especially that branch of it involving the consideration of population, its increase and support, the capacity for productive labor, and in short, the entire view of man as a *laboring animal*, claim this as a topic of the highest interest and moment in their important investigations.

3. The connection between man's food and drink, and his bodily soundness, or the influence of diet in health and disease, known as the science of dietetics, is the province of the medical philosopher. It is one small portion of this copious topic, which we propose making an humble effort to elucidate ;—expecting neither to astonish by dazzling hypotheses, nor to attract ephemeral attention or notoriety by the inven-

tion of novel plans of life, or by the resuscitation of the ancient schemes of Pythagorean or Utopian dreamers from their long sleep of death.

There is, it is conceived, a peculiar propriety in a treatise on diet which shall be applicable to the working classes of our community. Writers heretofore, in their researches on this subject, have had in view principally the wants and situation of the literary and sedentary, the rich and the luxurious, and this for obvious reasons ; the laboring man is little liable to suffer from errors of diet directly or even remotely. In the "march of intellect," the progress of which brings forward some fact and much fancy, the news may have reached even his ear, that he, in common with the more learned of his species, is guilty of errors, radical errors in his mode of life, which he had not even suspected ; that he has wandered widely from the natural laws of his physical system ; that he ought to make an entire alteration in his food to escape disease and secure long life ! Now to disabuse his mind of such chimeras, if such they are ; to give him some rational and intelligible views of what he errs in, and of what he is safe in pursuing, is a labor which is certainly not to be deemed unnecessary or superfluous. In attempting this, our aim is *utility*, practical, common-place, every-day utility ; to search out from sources of tried value, and re-convey in plain language, such practical, applicable information, as will enable even "the laborer in the climate of New England" to rise from the perusal of our essay, with at least some views which may make him a healthier, abler, and consequently a happier man.

"Contenta doceri, res ipsa ornari negat."

Our treatise will designedly be kept as close to the immediate question propounded, as possible, for two reasons ;—first, because any attempt to digress into the broad subject of dietetics in general, or the influence of food in disease, would necessarily require a research and examination the results of which would fill volumes, rather than the accustomed limits of a dissertation ;—secondly, that it is alone consistent with the expectation of producing a popular essay (for that seems to be the character which the language of the question designs), that it should be limited to reasonable dimensions as to quantity of matter, and free from professional or technical views as far as possible. Hence condensation will be attempted on a subject which, more than most others, tends to run into extended and discursive detail.

Such is the direct and obvious connection between health and aliment, that from the earliest history of man, his attention must have been compelled to this point of hygiene, or preservation of health. In the earliest of our books, the scriptural writings, we find ample proofs of this fact.

An almost complete code of dietetics is laid down in that portion of the Pentateuch, which gives us the account of the journeyings from Egypt of the chosen people ;—a code enforced by the immediate command of the Deity, particularly explicit and peremptory, still neither capricious or unnecessary, but founded on the nature of circumstances, and evidently adapted with wonderful sagacity and wisdom to the climate and to the habits of the Israelites.

The reader fond of this theological investigation may refer to a multitude of striking illustrations in the several books of Exodus, Leviticus, and Deuteronomy,* of the hygienic regulations of this people on their emigration to the land of Canaan. It would seem that their great simplicity of diet in general, their strict prohibition of numerous species of aliment, as well as their great attention to cleanliness, frequent ablutions, their geometrical and extended mode of encampment to secure free ventilation, &c. alone could have preserved a host of three millions, worn and dispirited, over the arid sands of an Arabian desert, from being cut off by epidemic disease.

The first author in medicine of whom we have the writings now extant, was Hippocrates.† His writings on medicine generally, and his treatise on diet especially, exhibit the high and almost exclusive importance which the “ father of medicine ” assigned to diet as a means for the prevention of disease and preservation of health and bodily vigor, as well as a curative agent.

From his age to modern times the medical writings of every age and country teem with dietetic precepts. To trace an outline of all the views, rational and absurd, of the thousands who have expressly treated on this subject, would require a volume alone. Modern philosophers, modern empirics, and modern innovators, it may well be imagined, have not allowed a topic presenting such rare opportunities, alike for profound research, for self-conceited and opinionated dogmatism, and for visionary novelties, to escape without inflicting on that patient animal, the public, more than its full burden of books.

The inquiry *what food is man designed by nature to use*, has always been considered as standing on the very threshold of the investigation into the subject of diet. It has been discussed, settled, re-argued and put to rest, a thousand times over, yet every few years sees some new disputant ready to enter the arena of controversy, or some new sect of

* Moïse a donné les preuves les moins équivoques, de ses connaissances profondes en médecine dans la partie de ses lois qui contient des préceptes d'hygiène.

Sprenghel. Hist. de la Méd. T. I. p. 68.

† On doit le [Hippocrate] considérer comme l'inventeur de la Diététique, qui a une influence si importante sur la conservation de la santé et sur le traitement des maladies.—Renardin.

fanatics ready to replace those who have "sunk to the tomb of all the Capulets."

It is demanded of us at the present time to enter more fully into an examination of this part of the natural history of man, than we should deem it profitable or important, except from some circumstances, which have rendered it here in New England desirable that the doctrines on this subject should be placed in their true light before the public. The circumstances alluded to (and which it may not be improbable form the immediate origin of this question having been selected and propounded for discussion), are plainly these: an extraordinary and truly unparalleled change has occurred within a few years past in this portion of the United States, in a most important circumstance of the domestic habits of the people; this is, the disuse of alcoholic drinks, where once they were employed to an extent having a most essential bearing on public health, life and happiness. In the progress of this change, happily denominated the *temperance reformation*, great and valuable researches were made into the effects of stimulants upon the human constitution. Following this train, some extraordinary, and, to the unprofessional class, doubtless novel, views in regard to diet were broached and have been since pressed upon the attention, and that too by at least some men of scientific reputation, ingenious lecturers and individuals who from weight of personal character, or their position before the public, possess no limited influence. They have persuaded themselves, and labored hard to proselyte to their own faith, that the use of animal food, in all its forms and varieties, is a custom, unnatural, injurious to bodily health, and even prejudicial to intellectual and moral sanity;—a custom at once unnecessary and inexpedient. How far, or how durably, they may have impressed the public with their views, time only can show; at present it need only be said, that such effect has at least been produced, as to raise a laudable curiosity and wish for the truth, in the minds of many, deserving to be gratified.

Their views and theories are by no means new or original. They date their origin at least as far back as the ancients, and they have been revived in every century from the time of Pythagoras to the days of the philosopher of Geneva.* "It is not intended to deny the right of ingenious men to propose innovations, and it is a fortunate circumstance that the public is as much too slow in coming into a practical acknowledgment of new truths, as men of erratic and visionary genius are too sanguine in promulgating and inculcating new hypotheses. It is dangerous

* J. J. Rousseau.

to unsettle long-established truths, for it is difficult to limit the extent of error. The gratification of a morbid desire to be distinguished as the propagator of new principles in philosophy, or as the head of a new sect, is not the only result to be expected from such heresies. New opinions or doctrines, whether true or false, will have admirers and followers, and will lead to practical results, and the errors of one man may lead thousands into the same vortex."

Animals have usually been considered by naturalists and physiologists, as constituting two general divisions, the food of one of which is derived from the animal, and the other from the vegetable kingdom. A third general division, less universally acknowledged as founded in nature, comprises those whose aliment is derived alike from the nutritive substances of both. These last are known as the *omnivorous* animals. This division of animals is extended still further, constituting varieties characterized by the kind of food which is *generally* used by them, or which is pointed out to them by a brute, instinctive propensity. Thus animals feeding on flesh are termed *carnivorous*; on fish, *piscivorous*; on insects, *insectivorous*; on vegetables, *phytivor*ous; on seeds, *granivorous*; on fruits, *frugivorous*; on the grasses, herbs, &c. *graminivorous* and *herbivorous*. Change of circumstances, necessity, domestication, &c. however, effect wondrous changes in what seems the natural, instinctive manner of selecting or avoiding different kinds of food.

The two classes of *flesh*-eating and *vegetable*-eating animals, are, as might, perhaps, have naturally enough been expected, *a priori*, constituted in a manner of bodily conformation so peculiar, and so differing from each other, that the naturalist under ordinary circumstances finds no difficulty in pronouncing with certainty what the kind of aliment naturally employed is, from an examination of the bodily organs; and *vice versâ*, the aliment being known, he can decide with as little risk of error upon certain peculiarities of bodily conformation. This is especially true towards the extremities of that great chain of gradation by which the animal creation is connected. There however exist certain races of animals, the swine, bear, some of the monkey tribes, and, as many philosophers maintain, the human species, a deduction of whose natural propensities as to food, from their organization, or the reverse, would, to say the least, be attended with greater difficulty and hazard of error.

The points in which the two grand divisions of animals, first named, are found to differ, are mainly in the organs of assimilation; some minor modifications are also noticed, such as the comparative vigor of internal and external construction, their temper and habits, peculiarity of the flesh as to putrefaction, &c.

Let us examine the most noticeable peculiarities of the masticatory organs of animals, as contrasted with those of man.

Carnivorous animals have the cuspidati, or canine teeth, very long and pointed, evidently designed to serve as weapons of offence and defence, in seizing, destroying, and lacerating other animals of less strength, ferocity or sagacity. In some varieties, as the cat kind, the lion, tiger, &c. these constitute formidable weapons. The molares, or grinding teeth, of the carnivori are elevated into pointed prominences, and the anterior teeth of the lower jaw shut behind or within those of the upper.

In the herbivori, these peculiar elongated teeth or tusks are wanting; the molares have broad surfaces opposed to each other, and in many species the enamel is intermixed with the osseous structure of the tooth, so as to form sharp ridges on the grinding surface, by which it is better adapted to the minute division and trituration of fibrous substances.

In man, canine teeth are found, possessing, however, little resemblance to those in the carnivori, as they project little beyond the level of the others, and are evidently unfitted for the purposes fulfilled by the cuspidati of the carnivorous tribes. The teeth in man are analogous to those of the monkey race, having so strong a resemblance to some of those animals, in this particular, as to form the strongest of the proofs brought forward in support of his being a *frugivorous* animal; an analogy or coincidence which we shall have occasion to demonstrate is by no means conclusive or substantiable, as to this point. The human teeth, Mr. Lawrence* thinks, have no resemblance to those of the carnivorous animals, except that the enamel is confined to the external surface. The cuspidati are also less developed than even in the simiæ or ape-tribe. M. Virey,† however, remarks, that the lesser molares in man have a moderate development of points or tubercles, which with his cuspidati, constitute the carnivorous portion of this part of the human structure, whilst the flattened molares form the herbivorous characteristic.

It is on this relative number of the different kinds of teeth, that M. Broussonet has made the fanciful suggestion that the herbivorous is to the carnivorous nature of man in the ratio of 12 to 8; an idea, the absurdity of which is sufficiently manifest.

The monkey tribe, like man, have four superior and four inferior incisores, two canine, and ten molar teeth; a variety, however, the sapajon, has two additional molares.

The carnivorous animals have six incisores in each jaw, two cuspidati, and from eight to twelve molares;—in the whole, from thirty-four to forty-two.

* Rees's Cyclop. Art. *Man*.

† Dict. des Sciences Med. Art. *Homme*.

The order glires, or gnawing animals, as the beaver, rat, &c. have only two incisor teeth in each jaw, no canini, and from six to eight or ten molares, making a total of from sixteen to twenty-four teeth.

The ruminating animals without horns, as the camel, dromedary, &c. have two upper and six lower incisores, two to four canini, and ten to twelve molares in each jaw ; total, thirty-four to thirty-six.

The horned ruminantia have no upper incisores, eight lower incisores, no canini (except in the stag, where they are found in the upper jaw), and twelve flat molares in each jaw ; in all, thirty-two.

The solipedes, as the horse, &c. have six incisores in each jaw, two canini in the upper jaw, none in the lower jaw, and twelve molares to each.

The above instances present an obvious general correspondence between the structure of this part of the masticatory apparatus, and the kind of aliment and the mode of its prehension, appertaining to the animal.

The conformation of the muscles moving the lower jaw in the carnivori, is much more adapted to great power of action than in the other animals. The temporal and masseter muscles by which the motion of elevation is effected, are large and powerful ; a deep depression exists in the cranium, giving space for the former, and a wide and elevated zygomatic arch, under which it passes. In man these muscles, and the form and size of this arch, are similar to those of the herbivorous animals, evidently not being designed for those powerful efforts in seizing and tearing to pieces living animals and food of great tenacity, which are requisite in the flesh-eating species.

The mode of articulation of the lower jaw is another point of distinction between the two great divisions. In the carnivori it is almost or entirely of the ginglymoid or hinge-like kind, allowing only of elevation and depression, or at most a very limited extent of lateral, or of forward and backward motion. This results from a peculiarity of structure ; the condyles, or articulating extremities of the lower jaw, are broader laterally, and the glenoid cavity into which these are received very deep, having two very considerable eminences, anteriorly and posteriorly. The pterygoid muscles, the use of which is to effect a lateral movement, are very small. In the herbivorous animals, and in man, the articulation is so loose as to allow a free lateral movement, and the pterygoid muscles well developed and powerful. This movement is evidently essential to a grinding separation of the food, whilst the restricted motion of the jaw in the carnivori, and the angular, tricuspid and cutting conformation of

their molares, are fitted for tearing to pieces their food, or dividing it perhaps by a scizzor-like action.

After leaving the organs of mastication, the stomach and alimentary canal are the next organs of digestion which exhibit a discrepancy between the two divisions of animals. And here we see an equally decided, well marked correspondence between the extent and structure of these viscera and the food of the animal;—the carnivori in general having their digestive apparatus much less complicated and less extended than those subsisting on vegetable aliment. The stomach of the latter is much stronger and more muscular; the length of intestine, compared with that of the whole body, much greater. In the carnivori, the alimentary canal varies from two to five times the length of the animal. In those living upon the blood of other animals, as the ichneumon, vampyre, bat, &c. the intestine is found only three times their length. In the lion, tiger, panther, &c. it is three times; in the wolf, four;—in the dog, five;—in the wild cat, three;—in the domestic cat, living in part on vegetables, five. In the simiæ or ape tribe, the comparative lengths of the intestinal canal are found to be from six to eight times the length of the body, without including the inferior extremities in the admeasurement. Cuvier gives the following examples on this point.

In the gibbon (*s. longimana*) 8; mandril (*s. maimon*) 8.2; macaque (*s. cynomolgus*) 6.3; (*s. patas*) 6.5; (*s. paniscus*) 6.3; magot or Barbary ape (*s. inuus*) 5.4. The last named is considered by the French naturalists as *demi-carnacier*—half carnivorous.

In the vegetable-eating tribes, the intestines are of much greater comparative length;—in the sheep, 28 times; ox, 22; camel and dromedary, 12 to 15; hare and rabbit, 12.

In the human species, the intestinal tube is ordinarily estimated by writers to be six or seven times the length of the body. In this admeasurement, it must be recollected that the lower extremities are included. If calculated as in the other animals, that is, the body and head alone being the measure, it is obvious that the comparative length will be materially affected, the ratio then being probably as 10 or 12 to 1, producing a more analogous resemblance between man and the herbivori, in this part of the structure.

In the carnivori, the large intestine, besides being comparatively short, is cylindrical in its form, whilst the herbivori have a large cœcum and a sacculated colon, besides in many species having a complex quadruplicated form of stomach. The sacculated form of colon is believed to exist in no one of the carnivorous animals.

In man the stomach is of a membranous kind and moderate size, like that of the flesh-eaters, and contra-distinguished from that of the herbivori, which is muscular and capacious. The cœcum in man is intermediate in dimensions between the two classes, and he has a colon divided into sacciform appendages, by longitudinal and transverse bands.

The difference between these visceral organs, in the two kinds of animals, is manifestly adapted to a wise purpose. The vegetable eaters, sustained by aliment containing but a small proportion of nutritive parts, capable of separation in proportion to the bulk of material ingested, require organs which will admit of the reception of a considerable quantity of food at once, a long delay for trituration, maceration, absorption, and the other processes of elaboration and assimilation, necessary to extract the nutritive particles from the mass of woody fibre and refuse unnourishing vegetable principles.

The same principle of the adaptation of organs to the nature of the food instinctively preferred, or at least generally employed, does not stop short in a defined and distinct line between what have been known as the flesh-eating and vegetable-eating animals. It may be traced still farther in the individuals of both these classes. For example, we shall find, amongst the carnivori, the digestive apparatus of those living by sucking blood, or on softened flesh or putrefying carcasses, is much less vigorous, muscular and extended, than those destroying their own prey, and devouring on the spot, like the feline races, "the entire animal," muscle, tendon, ligament and bone. An original difference of instinct, or propensity for different states of aliment, is also correspondent to this variation of structure. The lion, the tiger, &c. will never, except when compelled by urgent hunger, devour flesh in which decomposition has taken place; nor, on the contrary, will the ichneumon, hyena, &c. devour the recently killed animal, unless impelled by the same imperious necessity. Again: amongst those whose instinctive propensity leads them to a subsistence on vegetable food, the complexity of their organs differs according to the nature of their aliment; the grass-eating animals have a very different digestive organization, from that of the frugivori; and those instinctively selecting hard grains and seeds, are supplied with a still different and peculiar apparatus for grinding and thus fitting their unyielding aliment for assimilation.

Such are the principal anatomical data, on which can be founded an opinion on this point of the natural history of man. Naturalists have evidently been predetermined to make him, by the rules of natural science, an omnivorous animal. To arrive at this, however, they seem rather to

have been forced to jump to a conclusion, than to arrive at it by a legitimate deduction. Whilst the most distinguished in Europe, as Cuvier, Lawrence, Blumenbach, Richerand, Marc, &c. have recorded their acquiescence in this opinion, they as uniformly acknowledge that man is strikingly analogous in bodily structure to the simiæ, and as these are in their natural state undoubtedly frugivorous, it must be that their conclusion in regard to his omnivorousness is deduced from the circumstance of observation and experience of the species over the greater portion of the globe, rather than a strict inference from the data of natural history. His structure we believe proves only that he is neither decidedly carnivorous or the contrary ; he is also far from being omnivorous, if by that term he is considered as possessing the structure or powers of both flesh and vegetable-eating animals, since he is probably gifted with those of neither. It is true he feeds on all the productions of nature, but not in manner analogous to that of the brutes.

Whilst we believe and contend that the general practice of man in using both animal and vegetable food, in a prepared state, as is the almost uniform practice of all nations, is neither contra-indicated by natural structure or experimental result, we can freely allow that man does approximate more closely to the frugivorous animals than any others in physical organization. But the only conclusion which ought to be drawn from this similarity is, that he is designed to have his food in about the same state of mechanical cohesion, requiring about the same energy of masticatory organs as if it consisted of fruits, &c. alone.

Animals by a brute instinct will select, each species, a kind of food adapted to its capacity of digestion ; man has a digestive apparatus which is evidently designed neither for the use of animal flesh in its recent state or unchanged by the action of fire, nor in a state of putrefaction. His organs are evidently too complex and extended for the latter aliment. They are fitted for animal food *prepared by his reason*. In short, he was designed to be governed in his food as in everything else, not by instinct, but by his reasoning faculties. These have pointed out to him the general fact that neither animal nor vegetable substances are his appropriate food, till modified by preparation and cookery.

What we apprehend to be the true doctrine on this subject is, that his reasoning powers, enabling him to subject and subdue nature to himself, as far as food, habitation and clothing are concerned, and having in a thousand ways such an immediate influence on his bodily existence, forbid any very confident judgment or conclusion being formed in relation to him, from any real or supposed analogy to the other species of animals. He constitutes a species *sui generis*, far removed from all others.

The chain of beings, or regular gradation of animals, stops, at least, when it reaches him. The visionary theories of a Monboddó, or the philosopher of Geneva, in regard to the identity of orang-outangs and man, the existence of wild men, or those not under the influence of the reasoning faculties, &c. alike groundless and insulting to the human species, hardly deserve mention, much less refutation. They only prove, as Mr. Lawrence remarks, that these schemers were equally ignorant of the structure of men and monkeys. And yet how much less absurd are the opinions of those, who would subject "the lord of the creation" to rules and laws drawn from the habits of the monkey tribe?

If man is considered only as a superior kind of monkey, placing, as must be done, the African races as the immediate connecting link between him and the simiæ, and continuing the progression up through the less darkly tinged races to the polished European, then would the analogy be grounded on premises apparently philosophical.

Mr. Lawrence remarks on this scheme of gradation—"We should not have expected to find such opinions defended by the natural historian, and we shall not hesitate to assert that they are as false philosophically, as the moral and political consequences to which they would lead are shocking and detestable. We set out with this position, that man has numerous distinctive marks, by which under every circumstance of roughness and uncivilization, and every variety of country and race, he is separated by a broad and most clearly defined interval, from any other animal, even from those species which from their general resemblance to the human subject have been called anthropo-morphous."

For a full, philosophical and unanswerable elucidation of the distinctive differences between man and animals, the reader is referred to the physiological writings of William Lawrence, F.R.S. &c.

If, considering, as our modern Pythagoreans do, that man is by nature an exclusively vegetable-eating animal, and that therefore in our practices we should endeavor to act as to food without reference to reason, to shake off the trammels of education and habit, and to return to the customs of the golden age, will not the entire preparation of food by fire be legitimately deemed to be unnatural and preposterous? No animal surely practises the culinary art. Nor is there any nation of even their vaunted vegetable eaters, which does not more or less practise the unnatural art of subjecting their rice, or potatoes, or grains, to roasting or boiling, or which does not render them even more dissimilar from their original state by the more complex processes of pounding, grinding, &c. or the qualification of condiments.

It is a maxim in logic, that what proves too much proves nothing. If

it is unnatural to eat flesh, it is equally unnatural to cook vegetables, for both on these principles are the results of reason and not of natural instinct. Still more we transgress against the natural habits of animals when we resort to clothing. Does climate render the use of external clothing essential, why may it not render the use of stimulating and supporting animal food necessary? If the almost hairless simiæ or naked man can live without clothing in the regions of the torrid zone, in the frozen regions of the pole they must either violate nature and resort to external coverings, or cease to be inhabitants of its icy dominions. Man, by his reason, can counteract these imperfections of nature—or if that be too presumptuous an idea, can cure the wounds he inflicts on his own nature; he can render himself the denizen of all latitudes by his ingenuity in clothing and habitation, thus protecting his external structure; why not, then, by strengthening and guarding his internal organization by dietetic means (if these are necessary), adapted to the circumstances in which he may be placed?

How far, then, diet is influenced by climate as shown by the experience of mankind, and how far this influence is founded on true principles, is next to be considered. Do we ever find mankind living in a state of nature?*. Considering him an herbivorous or frugivorous animal, and their habits as the standard of nature, assuredly not. He is everywhere a *cooking animal*, and this term would perhaps be as well adapted in forming a definition of the *bipes implumis*, as Franklin's appellation of a *tool-making* or *bargain-driving* animal. Giving it up, then, as hopeless, even to conjecture what he would be, if following the customs of the animals exclusively eating raw vegetable substances, how can we so well deduce conclusions as to what mode of life befits him, as to appeal to the evidence of experience, and to examine his comparative health, longevity, bodily and mental vigor, and mental characteristics, as we find them displayed under varied circumstances of existence.

There are hardly any substances which have been possessed of organization and life (and these alone have the properties of nutriment), which have not been employed at some time and in some countries as food. Amongst the various circumstances and peculiarities in relation to aliment, if there has been any one which has been general in all nations, it is

* The terms *natural state*, *original condition*, &c. of man, so much employed by the advocates for an exclusively vegetable diet, we can hardly be allowed to suppose denote a state of barbarism. They would scarcely be willing to consider the influence of reason in producing a state of civilization, and overturning almost all resemblance between man and the brutes, to have been unnatural.

If, again, by *natural state of man* is meant the infancy of society, then "mankind were probably almost wholly carnivorous," remarks Professor Bunglison (Physiology, Vol. I. p. 441), "as the tribes least advanced in civilization are at the present day." Or more probably his food depended on his location or other accidental circumstances.

the preparation of their food by fire. Some exceptions even to this rule are not wanting.*

"The researches of Meiners," remarks Mr. Lawrence, "respecting food, seem to have exhausted every accessible authority on the subject. His deductions, supported by an almost infinite number of quotations, exhibit so complete a view of the matter, that we present them to the reader in his own words :

"The common positions concerning the earlier use of vegetables, and the effects of vegetable and animal food on the dispositions of people, have been brought forward by men not acquainted with all the facts which history presents. There were formerly, and still are, many people, particularly among the dark-colored nations, who eat nothing or almost nothing but flesh, and that with little or no preparation. Examples of this are offered in Asia by the Huns, Calmucks and people of Thibet ;—by the Burates, Tungoosees, Kamschatkans, and eastern islanders ;—by the Ostiaks and Samoiedes, whom the Russians were obliged to imitate in Nova Zembla and the eastern ocean ;—by the Woguls, Circassians, Mingulians and Abcassas ; and, lastly, by some tribes in Babylon. In Europe by the Alani, all the Celtic people, the Tartars of the Crimea, and even the inhabitants of St. Kilda. In America by the Esquimaux, the Greenlanders, the North American savages, the Peruvians, and the inhabitants of Terra del Fuego. In Africa by the Ethiopians and Gallas. In the southern countries and the islands of the South Sea, by the New Hollanders, New Zealanders, and the inhabitants of the Friendly and Society Islands."

"On the contrary, there have been and still are many people who live almost exclusively, or wholly, on vegetables. Such are the Cretans, Spartans and Romans at certain periods ; most of the Slavonic tribes, the Turks, Arabians, and Persians ; the Mahomedans, and still more the Brahmins in Hindostan ; the Chinese, Japanese, and certain of the Javanese ; most of the Otaheitan and inhabitants of the Marian Islands ;—lastly, the Egyptians, Moors, Negroes, Hottentots, and inhabitants of Sennaar."

* Examples are adduced of nations using certain mineral substances as food, or perhaps rather instead of aliment, as this term can hardly be applied to those substances from which no chyle can be formed. "Kessler," remarks Prof. Dunglison (*Human Physiology*, Vol. I. p. 438), "affirms that the quarriers on the Kyffhausen, in northern Thuringia, spread a *steatolite*, or *rock butter* (Jameson) on bread, which they eat with appetite. Labillardiere also relates of the inhabitants of New Scotland, that they are accustomed to eat a soft greenish kind of steatite, which he says serves to allay the sensation of hunger by filling the stomach. Vanquelin analyzed some of this, but was unable to extract anything nutritive from it. Long ago, Gumilla observed that the Otomaques and Guanos were in the habit of eating a kind of clay alone or with other substances. This practice was observed also by Humboldt."

These instances, while they afford abundant confirmation, if evidence were wanting, of the omnivorousness of man, at least in his present state, can only be regarded as extremes or exceptions to the general law. The food of a great proportion of the inhabitants of the globe is unquestionably an admixture of animal and vegetable substances, and on examination of many of the instances of the exclusive use of one or the other, it will be found to be dependent on peculiar adventitious circumstances, rather than on any original, instinctive propensity for either. The exclusively flesh-eating people will be found to be natives of those regions whose cold and sterile soil is incapable of producing the fruits of the earth. Whilst in some of the vegetable-eating countries, the mode of life in this respect is in consequence of religious dogmas, as illustrated for example in the immense nations of the east (in the same manner that with the ancient Pythagoreans it was an absurdity of their philosophy, the belief of metempsychosis); in others, as in Ireland, many parts of the continent of Europe, and probably also in some of the oriental countries, it results from a necessity, the over-crowded state of the population, which brings man down to the minimum of food capable of sustaining existence. From the statistical researches made in 1790, by the celebrated Lagrange, and brought up to a late period by M. Moreau de Jonnés, in a memoir to the Academy of Sciences, it is shown that France does not produce one-half the amount of the flesh of animals necessary to the nourishment of the inhabitants.

In referring to such a statement of the aliment used by various nations, as that given above from Meiners, we are struck on examination :

1. With the nearly equal health, longevity and vigor of all these nations. The general average of the length of human life is nearly the same; the appointed bourne of "three score years and ten," seems almost universal. The able writer on longevity in Rees's Cyclopaedia, arrives at the general conclusion, reviewing the catalogues of those recorded for longevity, that no characteristic applies to the individuals therein, but that of temperance in eating and drinking. Of course the quantity, rather than any peculiarity of the food, constitutes temperance.

2. The next general observation from this sketch, is, that as we go from the equator to the poles, the food of man changes from a preponderance of vegetable, to that of animal; and that in the temperate latitudes, except in such instances as that of Ireland, explained by obvious circumstances, the aliment is uniformly of a mixed nature, comprising both animal and vegetable substances.

Two circumstances in the natural history of man seem to have a necessary connection between them; viz. his having the power to inhabit

the various regions and climates of the earth, and his being able to subsist on almost or quite all organized substances, or, as Dr. Copland remarks, he must be naturally omnivorous, as a consequence of his ubiquity. "If the wastes of Lapland, the shores of the Icy Sea, the frozen coasts of Greenland, and the deserts of Terra del Fuego, were destined by nature for the habitations of man, then is he not an herbivorous animal, nor is even a mixed diet necessary to his support. It would be impossible to procure vegetable productions where the earth's surface is almost constantly either frozen or covered with snow. The continual use of animal food is as natural and wholesome to the Esquimaux, as a mixed diet is to an Englishman."

In the cold regions, the abstraction of the stimuli of solar light and heat, and the continued low temperature, have a tendency to diminish the powers of life, the energy and tone of the muscular and nervous systems. Here a compensatory addition to the vital energies is required, which is best afforded in the use of an invigorating and stimulating diet of animal food.

A similar equilibratory process from opposite reasons is demanded in the tropical regions, between the constitutional condition of man and his food. In the temperate zone, the same reasoning and the same experience which fix the expediency of animal food in the cold, and vegetable for the hot climate, demonstrate the fitness of a mixed aliment for the inhabitants.

Dr. Copland has carried the view of this connection between man and the soil he inhabits, into many interesting bearings, relative to his food, medicinal agents, &c. for which the reader is referred to his Dictionary of Practical Medicine, Art. Climate, in relation to the food of man. He concludes his article in the following words: "From these and other considerations, the following corollaries may be drawn;—that the climate of a country should in a great measure guide man in his selection of food: those productions which are most abundant around him, being most appropriate to the circumstances in which he is placed, and that the nature of his food thus conspires with the climate to modify his constitution, whilst it serves to counteract the rigors of season, and the unwholesome influences to which he is constantly exposed, in very hot as well as in very cold countries."

Our modern Pythagoreans have endeavored to argue that the use of animal food has a tendency to render men savage and ferocious in their dispositions, drawing this conclusion from the analogy of brute animals. The slightest, most cursory examination of the schoolboy's compend of geography or history dispels this visionary idea, and demolishes to the

foundation all their Utopian structures, based on restoring the golden age, by leading men back to a diet of "acorns and the crystal stream." Not to multiply examples to sustain a position so obvious, suffice it to remark, without recurring to ancient history, that Hyder Ali, and Tippoo, "his more terrible son," Ali Pacha of Yanina, and a host of oriental tyrants, were frugivorous animals !

It has been customary for these bigoted exclusives to bring forward a few instances of men eminent for transcendent genius and worth, as proofs that a vegetable diet is *alone* consistent with the possession and exercise of great talents and virtues. A more palpable *non sequitur* never disgraced logic. While they instance a Newton, a Howard, a Franklin, and some half dozen others, as examples of their rule (and of even the habits of these, some more specific accounts might not be amiss, as to their perseverance in an exclusively vegetable diet), they forget that these are only exceptions to a long list of great and renowned names.

"If the experience of every individual were not sufficient to convince him that the use of animal food is quite consistent with the greatest strength of body and mind, the truth of this point is proclaimed by the voice of all history. A few hundreds of Europeans hold in bondage the vegetable-eating millions of the east. We see the carnivorous Romans winning their way, from a beginning so inconsiderable that it is lost in the obscurity of fable, to the empire of the world ; we see them, by the power of intellect, establishing that dominion which they had acquired by the power of the sword, and furnishing such compositions in poetry, oratory, philosophy and history, as are at once the admiration and despair of succeeding ages ; we see our own countrymen rivalling them in arts and arms, exhibiting no less signal bravery in the field and on the ocean, and displaying in a Milton and Shakspeare, in a Newton, Bacon, and Locke, in a Chatham, Erskine and Fox, no less mental energy ; yet, with these proofs before their eyes, men are actually found, who would have us believe, on the faith of some insulated, exaggerated and misrepresented facts and still more miserable hypotheses, that the development, form and powers of the body are impaired and lessened, and the intellectual and moral faculties injured and perverted, by animal diet."*

We have no disposition to go "ultra crepidam" in vexing the theological arguments, which at least one learned professor adduces in support of his views, against the use of animal food ;—or to discuss the question whether the shortening of human life was the result of man's folly in thus overstepping the laws of his nature. Enough for us, is it

* Lawrence, Rees's Cyclop. Art. *Man*.

to know, that we have the best evidence for the belief that the term of human life has been for some thousands of years the same, and shall content ourselves with the ancient avowal of the psalmist: "The days of our years are three score years and ten; and if by reason of strength, they be four score years, yet is their strength labor and sorrow, for it is soon cut off and we fly away."* Having thus, as we conceive, cleared the way for a practical consideration of our subject, we dismiss an investigation perhaps needlessly protracted, surely so except from the considerations alluded to, in the words of Ovid:

Inter utrumque tene
— medio tutissimus ibis.

If it were or could be demonstrated that man is strictly an herbivorous, or a carnivorous animal, one only precept as to his food and drink need be urged upon him, and that would be to follow nature, and return as speedily as possible to the original manner of life from which he has departed. But as we have shown that man is intended to be governed by his intelligence, in cultivating, in preparing, in cooking and otherwise modifying the fruits of the soil and the flesh of animals, so as from their natural state to fit them for his use, such simplicity, however pleasing to the supposed discoverer (and in truth over-simplification and too hasty generalization are the loud crying sins of our modern philosophizing), is not in accordance with that grand touchstone of "law and fact" in medical science, *experience*. The truth seems to be, in the language of Dr. George Fordyce, "man has no natural food."† He may indeed have instincts and propensities, if not blunted or perverted, sufficiently strong and intelligible to prevent his interfering very materially with his health-

* Psalm xc. See also II. Samuel, xix. 32 et seq. "Now Barzillai was a very aged man, even four score years," &c.

† Professor Mussey, of Dartmouth College, N. H. in a lecture delivered during the session of the Legislature of New Hampshire, and repeated in other States, is reported to have brought forward the interesting, and well known and authenticated history of Caspar Hauser, as detailed by M. Von Fuerbach, as illustrating and defending the principle that man is by nature an exclusively vegetable-eating animal. Caspar, when first brought from his state of confinement into society, was struck with horror and disgust at the sight and smell of flesh or cooked meat. This repugnance was hardly to be combatted with, it was so overwhelming, nor was it, at the date of the biography, overcome. Granting the fact, and there is no reason to doubt it that we are aware of, and what does it prove? Merely that Caspar was from infancy trained up on a vegetable diet. It can demonstrate only, what no one can hardly think of denying, that the human subject is capable of being supported in vigor and health, on vegetable food exclusively—especially if, as in Hauser's cases, no exercise was taken nor any vicissitudes of season encountered.

As an offset to this case, we will attach here the account of another wild boy, which if any addition were needed to its authenticity beyond the names connected with, and

ful condition. It will be, it is believed, generally found to be true, that that mode of life or kind of aliment which experience proves detrimental, is at first repulsive to the taste or instinct of man. It is only the conventional customs of society which bring about a change, subverting the

referred to, in it, we could give it in our own knowledge of the circumstances, derived from intelligent gentlemen, when the writer was at the South a few years since.

“ *Wild Bill, or the Mississippi Orson.*—[From the Knickerbocker.]—It was the lot of that wonderful person, Caspar Hauser, to be emancipated and tamed among a people every way disposed to note all the peculiarities of a mind permitted almost to reach maturity before it had received the impress of a single effort at training it. This training was then undertaken, by instructors, excited by an enthusiasm of curiosity to trace the first manifestations of his mind under its new series of impulses. Of course, we have in his case the most impressive chapters upon the influence of the magnificent universe—the green earth, the sun and moon in the blue heavens, and the grandeur of the starry hosts, when first shown to him. We have a novel and most striking history of mind, under the first impressions of external nature, and the first lights of instruction.

“ The annexed and unpretending narrative lays no claim to virtues of this sort. Wild Bill, it is true, was thrown among a people humane and civilized; but they were pressed by the numberless and imperious necessities incident to a new settlement in the wilderness. Their condition was too full of labor, care, and danger, to admit of the exercise of curiosity. Thus they were less disposed to mark the first movements of his mind, after he had been caught and the process of training of society was commenced upon him. In a forest full of Indians and wild animals, Wild Bill was an object of very little higher interest than a tamed bear or panther. Of course, no documents remain to show how he was impressed by the new views which society presented to his mind. I have even been unable to ascertain whether any efforts were made to place him at school, or under the influence of any other instruction and training than that of the new circumstances in which he was placed.

“ Although his story may not claim parallel interest with the eloquent history of mind in the case of Caspar Hauser, it may, nevertheless, present one claim to attraction—it is literally a matter of fact, without the slightest admixture of coloring of any sort—and within the knowledge of citizens of the highest standing in Mississippi and Louisiana. Judge Butler, of the latter State, is capable of furnishing many more details than I have been enabled to obtain. Although I have heard the oral statements of many persons who have seen the subject of the narrative, I am indebted mainly for the facts it contains—with which the statements referred to uniformly agree—to one of the first planters in the parish of Rapides, in Louisiana. He became a temporary resident at Woodville, a considerable village in the interior of Mississippi, in 1811. Here he first saw the boy called Wild Bill, who then resided with a Mr. Benjamin Rollins. He had at that time made so much progress in learning to talk, that he was quite intelligible. It is believed that he had then been taken about eighteen months or two years.

“ He was secured in the Mississippi swamp, not far from the present site of Pinckneyville. The circumstances that led to his being taken, were these: Some settlers, who had recently settled in that vicinity, saw on the margins of the swamps the prints of the naked foot of a boy. This led them to closer observation; which soon discovered to them a naked boy, walking with the gait and the manner of a hunting animal, on the shore of one of the lakes that abound in that region. His object was to catch frogs—a species of hunting at which he seemed very expert. When he had caught them, he devoured them raw. The discoverer attempted to approach him; but as soon as the

natural relations (supposing such to exist, as is most probably the case) between the qualities of food, and the impressions made by them on the senses. The original appetite thus cannot be distinguished from the desire connected with the association of ideas, and the influences of habit.

wild lad saw him, he fled with the usual terror of an untamed creature at the sight of a man, towards a lake, into which he plunged—diving and swimming with the ease of an amphibious animal. These occurrences naturally excited much interest among the settlers; and they collected in a body to make an united effort to take him. After hunting for him for some time, they at length discovered him under a Persimmon tree, eating the fruit. As soon as he observed his pursuers, he fled as before, doubling the bush like a fox, and making again for the water. Excusing themselves by the motive, the hunters adopted their usual expedient for catching animals; they put their dogs on the trail of the strange game. The dogs soon tired him down, and brought him to bay. Though no metaphysicians to form mental theorems out of the case of their new conquest, they discovered that the two-legged, unfeathered creature, had the natural instinct of fight—for he made battle upon dogs and men with the full amount of courage and ferocity that might be expected to result from his age and physical strength. But although he fought like any other animal, he was compelled to yield to numbers, and was fairly caught and bound. He was then, it is supposed, not far from nine years old—naked, and perfectly speechless. His form was slender, but well proportioned and capable of extreme agility. His eyes were brilliant; his hair sandy, and his complexion florid; a circumstance which may be accounted for, from his having lived almost entirely in the deep shades of the forest. Woodville was the nearest considerable settlement, and thither he was carried for the experiment of domestication.

“Eighteen months or two years after his capture—the period, as I have said, when my informant first saw him—he had still a look indicative of his name. He was yet wild, although he could now make himself understood. It was more difficult to overcome his appetite for raw flesh, than to learn him to speak. The love of the excitement of alcohol, seems to be another common appetite of the man of nature; for he soon manifested an unconquerable longing for spirits in any form—especially when rendered very sweet—upon which he became intoxicated whenever he had an opportunity. Whether he discovered the usual development of the other animal propensities, my informant does not know; but he always remained a wild animal in the fierceness of his temper. When playing with lads of his age, the moment his passions were roused in any way, his first movement was to strike them with whatever instrument was nearest at hand. After this partial domestication, they attempted to put him to work; but he showed a truly savage disinclination for labor. He was sure immediately to run away; generally making for the town, where his amusement was to mount on horseback whenever he was allowed the opportunity. Riding was his passion; and he would mount every horse in a livery stable in succession, merely for the pleasure of riding them to water. In other respects he was quick and intelligent. His appearance was rather agreeable and in his favor.

“The training which he received was either unfavorable to good moral development, or it had been originally denied him by nature; for he became quarrelsome, addicted to drunkenness, and not at all a lover of the truth. Consequently, a great deal of doubt and uncertainty must rest upon his history of his early recollections; though they were so often repeated, and so nearly in the same form, as to have gained credence with those among whom he lived. He stated that he had a dim remembrance of coming down the Mississippi with his father’s family in a flat boat—that his father killed his mother—and

We can trace this acquired relish for objects at first almost, perhaps wholly, repulsive and disgusting, in the use of alcoholic stimulants, high-seasoned food, narcotics, as tobacco, &c. Again, in individuals, the most agreeable objects of taste may become repugnant, nay, even unwholesome, from association.

Nature and instinct being thus inadequate to guide man in his choice and preparation of aliment, or rather being subverted by mental influ-

that he fled in terror into the swamps, expecting that his father would kill him also; and that from that time he had subsisted on frogs, animals and berries; living in warm weather among the cane, and in cold weather in a hollow tree.

"It is extremely unfortunate that so few details remain of the domestication and character of Wild Bill; though it is hoped that this imperfect account may call forth from the persons with whom he lived and died, ampler and more satisfactory information respecting him. It is believed that he died when at the age of 18 or 19; that is, near the year 1818, after a domestication of about nine years. Alas! the uneducated and untrained Man of the Woods is but a kind of forked, standing animal, very little superior to what we call the lower animals, and in many respects far below them. And viewing the mass, even in the highest state of freedom and civilization—seeing them so readily and wilfully the victims of their ignorance, their prejudices, and, more than all, their own supposed knowledge and illumination—seeing, too, how easily and universally they become the stupid instruments of unprincipled, ambitious demagogues, one is almost driven to adopt the painful and humiliating maxim of Dean Swift, that man is not a reasonable animal, but only capable, under certain circumstances, of becoming such."

"*Note to the above.*—During our residence in Mississippi, we had frequent opportunities of seeing Wild Bill, as he was called; and the above account, with few exceptions, is correct. He was caught in the summer of 1808—and was first seen among a gang of wild hogs, which protected him as one of their number, and with which he associated and slept; and when the dogs were first put after him, his swinish friends formed a circle around to protect him, as they do to guard their weaker ones from similar attacks. The writer is mistaken in respect to his death. He was alive in 1825, and we have not since heard of his death. At that time his mind appeared wholly incapable of cultivation. To an entire stranger, his language was unintelligible, consisting of a kind of gibberish, understood, with ease, only by those intimately acquainted with it; indeed, to us, he appeared almost an idiot. He was an untameable creature, often found around small ponds, catching frogs and eating them raw. It was with great difficulty he could be compelled to wear any kind of clothing or come under restraint.—*Editor Shield.*"

This case certainly approximates much more closely to the *homo nature* than that of Caspar Hauser. Instead of being shut up in a closet with playthings, learning to speak and even to write his name, with his food brought to him prepared and in abundance, our Mississippi Orson was situated precisely like the wild animals who were his associates. And under these circumstances, we are as to his diet informed that he was at first discovered expertly catching frogs, which he devoured raw; afterwards under a Persimon tree, eating the fruit: and, lastly, we are told that it was more difficult to overcome his appetite for raw flesh, than to learn him to speak.

We are far from adducing this illustration from any wish to defend the doctrine of Helvetius and others, that man is by nature carnivorous. Deductions of general principles from single or limited instances, have, as was before observed, been the bane of medical reasoning.

ences, habit, &c. he is forced to appeal to experience to afford him rules by which he is to be governed in his food. It is the results of this experience (some better and some worse founded), which writers have given to the world in their volumes on diet generally; and their principal errors have been in drawing their conclusions from too limited a number of facts, and in too minute and subtle distinctions as to the wholesomeness of individual articles.

We apprehend that the point which has been too much overlooked in the researches upon diet, is the greater importance of *quantity*, than kind of aliment. It is on this error, we may premise, the burden of our views and suggestions will be based, having, as we trust, induced our reader to believe that almost all kinds of food are consistent with the health of the human subject, and referred him to sources by which he may convince himself that the longevity of individuals is connected rather with temperance in the amount, than with any peculiarity of his aliment.

Before any inquiry is proceeded in, which may suggest alterations and modifications in the diet of a people, their present actual habits and condition must become preliminary subjects of investigation.

The celebrated French traveller Volney,* presents the following sketch of the diet of the people of the United States, from observations made during his residence here about forty years since. "Lastly, the government, whilst it directs the attention of the inhabitants of the United States to these objects of domestic concern, should promote their being properly instructed with respect to one of the most essential and most radical causes of all their diseases, I mean their dietetic regimen, which in consequence of their origin, they have derived from the English and Germans. I will venture to say that if a prize were proposed for the scheme of a regimen most calculated to injure the stomach, the teeth, and the health in general, no better could be invented than that of the Americans. In the morning at breakfast, they deluge their stomach with a quart of hot water, impregnated with tea, or slightly so with coffee; that is, mere colored water, and they swallow, almost without chewing, hot bread, half baked, toast soaked in butter, cheese of the fattest kind, slices of salt or hung beef, ham, &c. all which are nearly insoluble. At dinner, they have boiled pastes under the name of puddings, and the fattest are esteemed the most delicious; all their sauces, even for roasted beef, are melted butter;† their turnips and potatoes swim in lard, butter

* View of the Climate and Soil of the United States of America. By C. F. Volney.

† This remark of M. Volney reminds us of a later exclamation of a French traveller, "Mon Dieu! what a country! fifty religions and only one sauce—melted butter!"

or fat ; under the name of pie or pumpkin [pumpkin pie ?] their pastry is nothing but a greasy paste, never sufficiently baked ; to digest these viscous substances they take tea almost instantly after dinner, making it so strong that it is absolutely bitter to the taste, in which state it affects the nerves so powerfully, that even the English find it brings on a more obstinate restlessness than coffee. Supper again introduces salt meats or oysters : as Chastelux says, the whole day passes in heaping indigestions on one another ; and to give tone to the poor relaxed and wearied stomach, they drink Madeira, rum, French brandy, gin or malt spirits, which complete the ruin of the nervous system."

This vivid statement of the Frenchman, though highly colored, from his indignation at our rude, unsophisticated, or, as he would consider it, unscientific cookery, is evidently based on truth and observation, and holds accurate in the main as to the diet of the New England laborer to the present day, or at least it comprises those peculiarities which so strikingly distinguish him from the inhabitant of the old world. He yet differs from the inhabitant of almost every part of Europe in having an ample supply of animal food twice, and often three times, a day, the quantity of hot drinks that M. Volney asserts, and perhaps their quality, as well as that crude simplicity of cookery which so much excites the Frenchman's wrath. He has also had, since M. Volney's residence here, a still more general and unfortunate abundance of alcoholic drinks, which, it will be readily allowed, have exercised such a devastating influence on human life in the United States, that a large per centage should be allowed on this account, in the comparison of any tables of mortality of this and other countries.

What is the fact in relation to the health of the inhabitant of New England ? This of course forms a question of the highest importance, indeed we may say, of an almost decisive character, as to his diet. We will make a comparison, as extended as may seem necessary for our satisfaction, of the average number of deaths in the population here, and contrast this with that in some other parts of the world, by which it will be evident, as far as conclusions can be deduced from such circumstances, that the habits of the New Englander, as to diet, approximate *nearer* than those of any other people to the standard of correctness. Below we give the minutiae of detail on which our conclusions are grounded, as we deem it necessary to make out this point specifically ; and though the data on which a judgment in relation to the mortality in New England can be based, are much less accessible than any one who has not made an attempt at an investigation would have supposed, yet enough is here exhib-

bited, it is believed, to render it certain that the annual proportion of deaths is not greater than one in from seventy to eighty individuals.*

The following may perhaps be considered as fair a statement as has been computed in regard to the proportionate mortality of different coun-

* Table designed to exhibit the annual per centage of mortality in New England :

Names of Places	No. of years and date	Average of Population	Average of Deaths	Per centage
Alexandria, N. H.	1. 1822	707	25	1.28
Amherst, "	39. 1780-1819	1,753	24	1.73
Andover, "	39. 1782-1821	1,194	11	1.108
Bath, "	1. 1822	1,498	20	1.74
Boscawen, "	1. 1823	2,113	38	1.56
*Boston, Mass.	19. 1813-1831	45,980	1,111	1.41
Concord, N. H.	30. 1792-1821	2,257	27	1.84
Charlestown, Mass.	1. 1822	6,591	105	1.62
Deerfield, N. H.	20. 1802-1821	1,950	22	1.88
Dover, "	1. 1822	2,871	54	1.53
"	1. 1833		59	
Durham, "	1. 1822	1,538	38	1.40
Epping, "	10. 1812-1821	1,170	16	1.73
"	1. 1834	1,158	11	1.105
Epsom, "	8. 1815-1823	1,336	16	1.73
Exeter, "	14. 1810-1823	2,200	27	1.81
Fitzwilliam, "	1. 1822	1,167	22	1.53
Hallowell, Me.	1. 1822	3,000	25	1.116
Haverhill, Mass.	1. 1834		73	
Hanson, "	1. 1822	917	32	1.28
Hartford, Conn.	1. "	4,726	125	1.37
Hopkinton, N. H.	2. 1822-1823	2,437	60	1.40
Kinzston, "	1. 1822	847	17	1.49
Jaffrey, "	1. "	1,339	14	1.95
Lynn, Mass.	1. 1834		152	
Milford, N. H.	16. 1806-1821	1,180	13	1.91
Nantucket, Mass.	1. 1834		224	
Springfield, N. H.	20. 1802-1822	717	5	1.143
New Haven, Conn.	1. 1822	7,147	144	1.49
New London, N. H.	1. "	924	13	1.71
Northampton, Mass.	1. "	2,854	45	1.63
New Chester, N. H.	1. "	971	12	1.80
New Market, "	1. "	1,083	22	1.49
Swansey, "	12. 1810-1822	1,558	19	1.82
Warner, "	6. 1817-1822	1,836	25	1.73
Pittsfield, Mass.	1. 1822	2,768	41	1.67
Pelham, N. H.	1. "	1,040	17	1.61
Newburyport, Mass.	1. 1834		112	
Warner, N. H.	6. 1817-1823	2,246	29	1.77
Worcester, Mass.	1. 1823	6,500	87	1.73
Sanbornton, N. H.	33. 1790-1822	2,626	31	1.85
Plymouth, Mass.	1. 1822	4,384	53	1.82
Weare, N. H.	10. 1813-1822	2,752	28	1.98
Portsmouth, N. H.	2. 1822-1823	7,327	110	1.65
Thornton, "	12. 1810-1822	825	6	1.137
Portland, Me.	2. " "	8,531	172	1.50
Salem, Mass.	1. 1822	12,731	225	1.56
Springfield, "	1. "	2,767	43	1.64
Weare, N. H.	1. "	2,781	20	1.139
Derry, "	4. 1830-1834	2,500	25	1.100
Pembroke, "	1. 1822	1,256	11	1.114
Francestown, "	1. "	1,479	8	1.184
Exeter, "	1. 1834	2,800	28	1.100

* From Dr. Storer's tables in the Medical Magazine.

tries. It is abstracted from the report of a very distinguished writer on medical statistics, M. Moreau de Jonnés, which was presented to the French Academy of Medicine at the Séance of July, 1833.

The ratio of mortality is—in Batavia, 1 in 26 ; Trinidad, 1 in 27 ; Martinique, 1 in 28 ; Bombay, 1 in 20 ; Havana, 1 in 33 ; Roman States, 1 in 30 ; Old Venetian territories, 1 in 30 ; Greece and Turkey, 1 in 30 ; the Low Countries, 1 in 39 ; France,* 1 in 39 ; Prussia, 1 in 39 ; Switzerland, 1 in 40 ; Austria, 1 in 40 ; Spain, 1 in 40 ; Portugal, 1 in 40 ; Russia, 1 in 44 ; Poland, 1 in 44 ; Germany, 1 in 45 ; Denmark and Sweden, 1 in 45 ; Norway, 1 in 48 ; Ireland, 1 in 53 ; England, 1 in 58 ; Scotland, 1 in 59.

In several of these countries, which are situated within the torrid zone, ample causes other than those connected with diet, exist for the great ratio of mortality. In others the circumstances of climate, civilization, &c. approximate more or less closely to those of New England. And while in some we must allow a considerable per centage for some peculiarly life-shortening circumstances, such as over-crowded population, burdensome taxation, despotic oppression, &c. we have a right to set up the mortifying claim, that no inconsiderable allowance, as before observed, should be made in the New England computation, for the deaths, occasioned over and above what occur in European countries, by the inordinate use of alcoholic drinks, which it is well known are obtained here at

Table continued.

Names of Places	No. of years and date	Average of Population	Average of Deaths	Per centage
Sanbornton, " - - - - -	32. 1790-1823	2,627	31	1.85
Bow, " - - - - -	10. 1812-1822	935	12	1.77
Bradford, " - - - - -	9. 1809-1817	1,176	16	1.74
Brookline, " - - - - -	5. 1808-1812	538	5	1.107
Canterbury, " - - - - -	12. 1810-1822	1,611	17	1.94
Dublin, " - - - - -	6. 1816-1822	1,620	15	1.108
Fitzwilliam, " - - - - -	21. 1802-1822	1,252	14	1.89
Hawke, " - - - - -	10. 1812-1822	421	5	1.85
Hollis, " - - - - -	25. 1793-1818	1,642	23	1.71
Lyndeboro' " - - - - -	10. 1812-1822	1,121	16	1.70
Rye " - - - - -	37. 1785-1822	1,127	11	1.100

In 20 towns in N. H. and Ms.† in 1806 Pop. 31,328 No. deaths 446 Per centage 1.70
 In the State of N. H.‡ by calculation 244,161 3,000 1.81
 Towns in Massachusetts§ 1.81

* In France, in 1780, the deaths were annually 1 in 30 ; but during the eight years previous to 1824, 1 in 40, or one-fourth less.

† Med. and Agric. Register for 1837, page 284. The mortality in the various towns in the table is from various sources entitled to credit—N. H. Hist. Collections, Annals, &c. &c.

‡ "The annual average number of deaths in New Hampshire is estimated at about 3000. This number has been obtained by taking the mean annual average of a number of towns in different parts of the State for a series of years, and making a comparison, by the rule of proportion, between these towns and the other towns in the State."—*N. H. Gazetteer*, by Farmer & Moore.

§ "In several towns on Connecticut River in Massachusetts, the annual average mortality for fifteen years is 1 in 81."—*Dr. Brigham. Influence of Mental Cultivation*, page 95.

an amount of cost, as estimated by the quantum of labor, unexampled and unheard of elsewhere.

Since, then, the average of health and life (inferring the fact of health from the comparative amount of death, a statement probably true in this connection, though doubtless subject to exceptions in those latitudes and localities subject to malarious diseases, intermittents, &c.) is greater in New England than elsewhere, and as the climate, customs of temperance, &c. cannot be considered as peculiarly or even commonly suited to health, it seems but fair to conclude that the habits of the people as to diet are *as near what they should be*, as those of any part of the world.

The consideration of the degree of bodily vigor, of intellectual capacity, of moral and manly feeling, would be a subject of proud recapitulation to the native of New England ; but so little room for doubt exists as to these in the mind of any one acquainted with their past history or present character, that we may without the imputation of vanity say, that nothing unfavorable to his manner of life, as far as diet has any influence on these characteristics, can be deduced from an examination of our population in this point of view.

Though we thus freely and decidedly avow our belief in the general correctness of the diet amongst us, we cannot lose sight of the fact that there are many points in which it may be improved. This is more especially true in regard to the modes of life of our literary and professional men ; but as our treatise is confined to the consideration of the diet of our *laboring classes*, the interesting inquiry into the changes demanded for the former cannot be pursued.

Since, then, no radical changes are deemed essential or expedient, an examination into the principal errors in the actual diet of the New England laborer, will determine an answer to the original interrogation propounded. These errors are :

1. Too great a proportion of animal food. Although having at the commencement of our undertaking arrived at the conclusion that the use of animal food, in its prepared state, as employed by civilized man, was neither contra-indicated by his anatomical structure, nor by the evidence of experience, we are still no less willing to admit that one of the most crying abuses in our system of diet is the over-abundant employment of flesh. We place this error in the first rank, not because we are inclined to make that strict line of demarcation between animal and vegetable substances which recent *ultraism* in dietetics would fain prescribe. We are persuaded that too much stress has been put on the abstract consideration of food, as animal, or vegetable ; the former in itself being looked upon as positively deleterious, and not as being the foundation of over-eating,

that is, the supplying the system with too great and too rapid accessions of nutritive material. Some of the enthusiasts on this subject seem, both in theory and practice, not so much to have guarded against undue repletion generally, as to have fulminated their cautions and warnings against this one prominent cause of gluttony ; they have freely employed and allowed butter, cream, cheese, eggs, sugar, &c. and other articles of aliment the most highly concentrated in nutritive properties of any we are acquainted with, whilst the smallest quantities of the plainest cooked animal food have been proscribed, and that on reasoning hardly more substantiable than the dogmas of oriental religion, or the dreaming fantasies of Rousseau.

The views which many popular writers on this subject have thrown out in relation to the digestion of animal food, are exceedingly loose and unphilosophical. They speak of it as being so highly *animalized*, that is, so nearly approximating in its composition to the human body, that by implication they must be understood to mean that it is excepted from the ordinary changes of alimentary matter in the digestive organs, and is received into and becomes part of the economy by direct absorption, or by some more summary and expeditious process than that of being resolved and re-composed. Animal and vegetable substances, by the analyses of chemistry, are reducible into the same ultimate elements, oxygen, hydrogen, carbon, and, in most animal and a few vegetable matters, azote. The better opinion of modern physiologists is, that there is no one constant principle of aliment which alone is capable of assimilation. Haller, for example, thought this principle to be jelly ; Cullen that it was oil and sugar, or a combination of these ; Fordyce that it was the mucilaginous portions ; Richerand that it was always gum, sugar, or mucilage. It seems, however, to be sufficiently demonstrated that in the elaboration and formation of chyle, the food is resolved into its original elements, and by vital affinities not well understood, re-composed into the organic structure. Hence whatever is, from its chemical composition and mechanical structure, susceptible of being decomposed by the organs of digestion, is capable of being applied to the uses of the system. The resistance which different substances offer to this decomposing process forms their degree of digestibility ; their nutritiveness, supposing entire digestion is effected, will depend upon the difference of their elementary composition, and can be deduced only from experience, and not, as yet, from chemistry.*

* It will be taken for granted that the ordinary views of the processes of assimilation are substantially correct, or at least more true than false, as well as known to our reader; that although there may be many errors, absurdities and inconsistencies in the accounts

Animal food, it would appear, directly from the experiments of Dr. Beaumont, as well as presumptively from the observations of former writers, is carried through the processes of digestion in a much shorter space of time than other substances, and the resulting chyle added to the circulatory system with great rapidity. See experiment 26, of Dr. Beaumont,* in illustration of this fact. The residuum left undigested of animal food is comparatively inconsiderable. Hence after the ingestion of this, the quantity of blood is augmented very considerably and very rapidly. This occasions a change in the equilibrium of the circulation, far beyond what

of this function by our best physiologists, still we have the basis of fact for the great outlines of a system of digestion through the agency of a *gastric juice*. The experiments of Spallanzani, of Tiedeman and Gmelin, of Leuret and Lassaigne, seem to demonstrate the existence and agency of such a fluid.

If there are, and no doubt there must be, many of our American medical men, whose faith in the common system of digestion has been shaken by the talented, ingenious and philosophical treatise of Prof. Smith, of Baltimore, on Digestion [Physiological Essay on Digestion, by N. R. Smith, M.D. New York, 1826], or if there are any who have embraced the later views of a Philadelphia professor [Principles of Medicine, by Samuel Jackson, M.D. &c. Philadelphia, 1833], (which latter supposition is hardly possible, as his ideas are veiled in the Cimmerian darkness of incomprehensible verbosity), the recently published labors of an American surgeon must go far to produce a re-conversion to the olden doctrine.

We allude here to the "Experiments and Observations on the Gastric Juice and the Physiology of Digestion, by Wm. Beaumont, M.D. Surgeon in the U. S. Army," a work composed under circumstances which gave the writer a deeper entrance into the very penetralia of Nature's temple, than has been before accorded to any individual. Although evidently not pursued with that systematic and scientific ingenuity which have characterized the investigations of the French physiologists, still these experiments have a degree of precision in detail, a *véraisemblance*, which, wherever they go, or however long they may exist, will never lose their value, as *facts*. (*Opinionum commenta delet dies, naturæ judicia confirmat. Cicero, de Natura Deorum.*) The author is evidently unaccustomed to experiment for the purpose of book-making, or to warp the results to suit a peculiar theory or a new hypothesis. We shall draw considerably on his volume, for illustrations on what we deem the most important points of a code of dietetics. Dr. Beaumont's now well-known experiments were made on a young Canadian named St. Martin, in whom was a fistulous opening into the stomach in consequence of a gunshot wound. This opening was provided by an expedient of nature with a sort of valve, preventing the escape of the gastric contents and placing the organ in nearly its original state, but capable of being pushed aside in order to admit substances to be experimented upon. The digestion of the individual, and consequently his health, strength, and capacity for labor, &c. were in a natural state.

This case, so interesting and important, is in some respects not unique. For a similar example of fistulous opening into the stomach, the medical reader is referred to the *Éléments de Physiologie* of Richerand, Tom. I. p. 202. The same case is also recited in the *Dict. des Sciences Med. Art. Digestion*. The experiments in this instance were comparatively imperfect and unimportant, on account of the broken down state of the patient's health and constitution.

* Op. supra citato, p. 143.

would result from the more gradual addition of supplies to the circulating fluids. In the latter case, during the time the chyle was being poured into the blood, a portion of that fluid would be expended upon the various offices of the system, and the vessels become accommodated to their increased fulness. Nature in the human system abhors sudden changes as much, in truth, as the ancient natural philosophers fancied she did a vacuum. After a full meal of animal food, the action of the heart is soon materially increased, the pulse becoming fuller and stronger ; the face is flushed ; the brain is oppressed, as is evident from the drowsiness, and the indisposition for mental exertion or bodily exercise ; in short, a general disturbance of the constitutional powers is manifested. This excitement has been described by Dr. Paris, as “ the digestive fever.”

After the lapse of a few hours, in which nature has been busily at work to disburden herself of the load thus cast upon her, through the medium of discharging a portion from the various emunctories, and, as it were, waste-gates and safety-valves, of the system, and fitting the remainder for the various uses of the economy by the agency of the pulmonary, and perhaps other organs, the system arrives at its original level, till it is again called upon to be over-stimulated by too much and too nutrient diet. The fluctuation produced by a quantity of food sufficient only to repair the waste of the system, is something, but not of that overwhelming, destructive character, which gluttony produces ; keeping up a constant warfare between the conservative power of the constitution and the intrusion of over-supplies. The springs of life are urged on too fast, by over-stimulation from this cause, in a manner similar or rather analogous to the undue excitement produced by alcoholic stimuli. The excitability of the system is worn out and exhausted.

The effect of a repetition of the excitement of too much nutriment added to the system, is ultimately to give too great a preponderance to the sanguiferous function. Although the plethoric habit of body is to be, and generally amongst the laborers in New England is avoided by their great amount of bodily exercise, the surplus nutriment is disposed of, in a great portion, through organs of great delicacy and importance, the lungs and skin. These are thus called on to execute habitually more than they can perform, without rendering any sudden derangement or stop of their functions a serious interference with the healthy state of the individual. Have we not in this suggestion, conjoined with the changing character of our climate, a key to the prevailing habitudes of morbid action amongst our population ? Experience shows that a great proportion of the diseases of New England are diseases of excited action, requiring the employment of the lancet and other depleting measures to an extent

unknown and unparalleled in other countries.* We may account in part for this notorious fact, by considerations of climate, but the constitutional peculiarity or temperament must be mainly ascribed to an over-nutritive and over-stimulating diet.

Some further observations on the unnaturally augmented action of the cutaneous and pulmonary transpiratory functions will be added, when considering the influences of hot fluids on the health.

To what extent a reduction in the quantity of animal food should be made, we believe it is impossible to say with precision; to lay down any general rule which will meet individual application. The grand principle is, that the quantity of nutritive aliment should be in proportion to the expenditure of the energies of the system by active exertion of body, having in view individual temperament, habits, &c.

This, like all other points of diet, can be solved only by experience. The writer has found, on pretty extended investigation into the habits of the first settlers of the part of the country where he resides, who were pre-eminent for health, longevity and bodily strength (so much so, that a distinguished collector of statistical facts has drawn most of his illustrations and premises on longevity from them†), that a much less amount of animal food was formerly employed than at the present day. They restricted themselves to two meals, of which meat was a part, per day, the third, or supper, being simply of bread and milk, *hasty-pudding*, &c. almost universally.

The objection which recent writers and lecturers, who advocate the entire disuse of animal food, make to it on account of its being aliment in a too concentrated state, that is, having too small a proportion of indigestible parts, deserves consideration. This objection is generally considered as sustained by the experiments of Magendie and other physiologists, on animals. Dogs, rabbits, &c. fed on oil, sugar, &c. which are almost entirely convertible into chyle, became diseased and died in the course of a few weeks. His conclusion at first was that animal life could not be sustained without the food contained a proportion of azote, which, in the highly nutritive substances he experimented with, was wanting. Subsequent experiments convinced him that his first conclusions were not well grounded, and "induced him," remarks Prof. Dun-

* What would a country practitioner in New England (of which unfortunate fraternity, the writer (*horresco referens*) acknowledges himself to be one) think of treating a pleurisy, or enteritis, or any other acute inflammatory disease, after the mild plan of ptisans, antimonials, &c. laid down in our medical journals, as practised in the French and other European hospitals!

† Worcester. *Annals of the American Academy.*

glison, "to conclude, as Dr. Bostock and Sir Charles Bell have since done, without being aware apparently of Magendie's observations, that variety and multiplicity of articles of food constitute an important hygienic rule." "This," Magendie adds, "is indicated to us by our instincts, as well as by the changes that wait upon the seasons, as regards the nature and kind of alimentary substances."

That the bulk of food, or rather its admixture with indigestible substances, is an important circumstance to a healthful digestion, is a fact long since known and freely admitted. Even the personal experience of the savage Esquimaux has taught him to mix his train oil with saw-dust. The necessity of bulky food is perhaps adequately explained on the view of the influences produced by aliment on the constitution, when its nutritive proceeds are too rapidly turned into the circulation ;—perhaps something, too, may be allowed for the effects produced by the stimulus of distension, which the stomach, like the other hollow viscera, may require for the due performance of its office. At all events, this objection of too great concentratedness goes only to establish, what at the present day no one would be found to advocate, the inexpediency of an exclusively animal diet.

The next prominent error in the diet of the New Englander, running into and intimately connected with that which has just been considered, is the too abundant use of food generally.

Many of the weighty objections to an undue use of animal food will equally apply to the excessive ingestion of an ordinary mixed diet, and therefore no more need be urged, as to the general effects produced on the system by over-eating. It is hardly necessary to observe that there can be little probability, perhaps scarce a possibility, of injury being done to the system by plethoric repletion, if the aliment is confined wholly to vegetable substances. And we may observe, *en passant*, that we know of no objection to the sedentary, who have few calls upon the excitability of the bodily system, making their diet exclusively vegetable, provided their digestive organs are equal to the labor of converting the requisite amount of this nutriment to the wants of the economy. Indeed to those of this class, possessing little command over their sensual propensities, the entirely abstaining from animal food may be advisable.

We shall regard this branch of dietetic error only as to its influence in producing derangement of the digestive organs ;—its evil effects, to be sure, soon become general or constitutional, but in a different manner from those before mentioned. The human stomach is capable of mastering or converting to the uses of the system only a certain portion of aliment. The rationale of this fact, so long known to observers and phy-

siological writers, was never clearly explained until the experiments of Dr. Beaumont proved conclusively, that the gastric fluid ceased to be secreted beyond a certain limit, however much food might be taken into the stomach; and that this secretion was analogous to a chemical agent in its action on the food, combining with a definite proportion only, becoming saturated and inadequate to produce any further effect. Consequently all the food, beyond what was required to neutralize the gastric juice secreted, remained in the stomach to act as a foreign irritating body, running into the common chemical changes and decompositions of animal and vegetable matter subjected to a warm temperature, as fermentation, the extrication of gases, &c. The product of such changes acting on the extremely delicate and irritable surface of the stomach, could hardly fail of destroying its integrity of function. The effects of food left undigested in the stomach of the individual who was the subject of Dr. Beaumont's experiments, were speedily marked and of a most decided character. Though in this, as in all other cases, too decided generalization should be guarded against from a single case, we may yet observe that facts deduced from his experiments on St. Martin prove as much as single facts ever can do, as that individual's health, strength, exercise, habits, &c. were much like those of the average of our population.

"After excessive eating or drinking, chymification is retarded, and although the appetite be not always impaired at first, the fluids become acrid and sharp, excoriating the edges of the aperture [i. e. the accidental opening through the parietes of the stomach]; and almost invariably produce aphthous patches and the other indications of a diseased state of the internal membrane, mentioned above. Vitiated bile is also found in the stomach under these circumstances, and flocculi of mucus are much more abundant than in health."*

The first experiment performed on St. Martin (Op. Cit. p. 126), abundantly confirms the opinion that undigested portions of food in the stomach, produce all the phenomena of fever. A piece of raw, unmas-ticated beef, remaining of a considerable quantity of aliment which was duly assimilated, occasioned considerable distress, uneasiness, and finally pain in the stomach, general debility and lassitude, pain in the head, costiveness, depressed pulse, dry skin, coated tongue, and numerous white spots or pustules resembling coagulated lymph, spread over the inner surface of the stomach, requiring the exhibition of medicine to relieve these symptoms.

* Experiments, page 108.

The restorative powers of the constitution will not always resist the inroads of this enemy, excessive eating, but must ultimately succumb either by yielding up the stomach to dyspeptic disease, or by transferring the influence of morbid irritations to other organs. The first inquiries, in understanding the full meaning and force of any dissuasions from the use of too much aliment, would seem to be, what is excessive eating? what is too much food? when and how shall it be determined that enough has been taken for all the necessities of the constitution, and not too much? All will agree upon the evil effects of gluttony and excess. The scholar might trace through the records of general and medical literature, and never cease to find maxims and essays against too much eating. Yet the standard of temperance in this indulgence remains still an uncertain, indefinite point.

Some writers on dietetics, looking upon it as a vain endeavor to establish any rule, by which the just measure of food can be determined by any internal sensations, would reduce the stomach of all individuals to a Procrustean measure, and decide upon the quantity by scales and weights, pints and pounds. Others, again, as Fordyce, Fothergill, Paris, Phillip, &c. believe that a kind of internal monitor exists, viz. the first feeling of satiety, whose warnings, if duly observed, are enough to govern the individual safely.

The attempt to regulate food by weight and measure we look upon as the height of absurdity, at least for the healthy laboring man. The wants of the human constitution vary in every individual, no doubt, as much proportionably, as the stature, the pulse, the quantity of air respired, &c. Besides this original constitutional difference, the circumstances of habits, exercise, climate, &c. must give rise to no inconsiderable diversity.

The great indication which we believe is to be aimed at, by those who would pursue the happy mean between asceticism and gluttony, who would enjoy "the hidden essence of epicurism," was discovered a century since by Dr. George Cheyne.* It is this:—"A constant endeavor after the lightest and least of meat and drink a man can be tolerably easy under, is the shortest and most infallible means to preserve health, life, and serenity." The criterion before referred to, that of watching the point of satiety, as it has been called, at which enough food has been taken, is, we believe, of value, but subject to qualifications of several kinds. 1. It will not apply to the case of dyspeptics;—in them the feeling of hunger is often morbid. The appetite exists far beyond the

* On Diet and Regimen.

power of digestion. 2. It is deceptive when a variety of alimentary substances are presented to the appetite, or the stomach is pampered and stimulated by condiments, over-refined cookery, &c. Independent of that natural hunger which produces a craving for food, a sensation of appetite depends on that association of ideas which connects the satisfying the desire with pleasurable sensations; hence when the point of satiety is reached as to one variety of food, the desire of taking more is reproduced on a new and palatable kind being presented, and this perhaps for a third or even a fourth time.

3. It does not hold true in cases where mastication and deglutition are performed too rapidly. The proper object of eating is to convey to the stomach just food enough to neutralize the gastric juice which may be formed. If the food is thrown into the stomach hastily, this point is overreached, and consequently a quantity of undigested aliment is left in the organ.* 4. It will not apply to the sedentary, in whom the equilibrium of

* While we thus add our mite of opinion to corroborate the common view, that dyspeptic derangements have a fertile source in the abuses to which the stomach is subjected, we would enter our positive dissent against this being considered their only considerable cause. There are other abuses of organs connected with or influencing those of digestion, which deserve to come in for a full share of that blame which has been too indiscriminately cast upon the latter. We have been struck with the force and general truth of some views on this subject, published in a little work, by Dr. Brigham, of Hartford, "On the Influence of Mental Cultivation on Health." He perhaps falls into the common error of exclusiveness, which seems the almost universal propensity of medical philosophers. They, knowing no mean, run from Scylla to Charybdis; in establishing their own views, they seem determined, with a few exceptions, to acknowledge "no divided empire."

—Sunt certi, denique, fines
Quod ultra, citra que, nequit consistere rectum.

"Dyspepsia," he remarks (p. 103), "is generally considered a disease of the stomach. But I apprehend that in a majority of cases, especially among students, it is primarily a disease of the brain and nervous system, and is perpetuated by mental excitement."

"Good living" is said to cause dyspepsia; but the most healthy people I have ever known have been among those who lived well, who eat freely several times a day of the most nutritious food. By some it is said that tobacco, snuff, tea, coffee, butter and even bread cause this complaint; but whoever will make inquiries on this subject throughout the community, will find that this is seldom true. In fact, dyspepsia prevails, according to my experience, altogether the most, amongst the very temperate and careful as regards what they eat and drink and the labor they put upon the stomach, but exceedingly careless how much labor they put upon that delicate organ, the brain."

"Finally, if dyspepsia is a disease of the stomach, why is it not more frequently cured by attention to diet, than it is? I know that by this method some are relieved, and I also know that those disposed to dyspeptic disease, will not be able to continue their severe studies, if they are not careful as respects diet. For if the vital energy is all directed to the brain and consumed by the act of thought, the stomach will not be able to digest much food."

the constitutional powers cannot be maintained, if the sanguiferous system is overburdened, as must occur from full feeding, without exercise. We consider that the laboring man is best consulting his health and strength of body, when he takes for his guide in his aliment this general rule:—to use an admixture of both animal and vegetable food, but of no great variety of either;—to eat slowly, both with a view to proper mastication and to prevent excess; and lastly to finish his meal on the first sensation of having taken enough. We give in the language of Dr. Beaumont what meets our ideas, in regard to this long sought point of satiety. “There seems to be a sense of perfect intelligence conveyed from the stomach to the encephalic centre, which in health invariably dictates what quantity of aliment (responding to the sense of hunger and its due satisfaction), is naturally required for the purposes of life, and which if noticed and properly attended to, would prove the most salutary monitor of health, and effectually preventive of and restorative from disease. It is not the sense of *satiety*, for this is beyond the point of *healthful* indulgence, and is nature’s earliest indication of an *abuse* and *overburthen* of her powers to replenish the system. It occurs immediately previous to this, and may be known by the pleasurable sensation of *perfect satisfaction, ease and quiescence of body and mind*. It is when the stomach says *enough*, and is distinguished from satiety by the difference of the sensations—the former feeling *enough*—the latter, *too much*.”*

Distinctly connected with this point of dietetics, is the consideration of the next great error in the mode of life of our people, which is too slight mastication and too hasty deglutition.

The process of mastication has the double and important offices of comminuting or dividing the aliment, and mixing it with the secretions of the salivary glands. Both of these processes have been dwelt upon by authors, as of high moment in the digestion of food, especially the last mentioned. By some it has been considered that the admixture of the saliva is a vital process in digestion. Dr. Paris† speaks of the food being intimately mixed and combined during mastication “with a chemical solvent, which prepares it for the process it has shortly to undergo in the stomach.” And again, “the introduction of saliva into the stomach is obviously essential to a healthy digestion.” “Insalivation, therefore, is as essential as mastication.”

A late American writer‡ considers this, if possible, of still higher moment; the saliva being, if we can get at the true intent of his language (which strikingly requires a translation into the vernacular), the principal

* Experiments, p. 64.

† Treatise on Diet, &c. p. 36, et seq.

‡ Dr. S. Jackson, Op. Citato.

agent in effecting the process of digestion. "There is every probability," he remarks, "that no other gastric juice really exists, than the salivary fluids, mixed with mucus, follicular secretions and the exhaled or perspired fluids of the gastric mucous membrane." His ideas, however, seem to be merely the modified views of the French physiologists Magendie and Mont'gre on this topic.

On the other hand, many writers consider the secretion and admixture of the saliva as performing a very slight and unimportant rôle in the function of digestion. Fordyce and others view it as a mere simple fluid, destitute of all chemical or otherwise energetic properties, designed to lubricate the membrane of the mouth, pharynx and œsophagus, and thus facilitate the act of swallowing.

Dr. Beaumont in his work takes the same view of insalivation, regarding it only important as a preliminary to digestion.

However this may be, and we are inclined to think that the principal object of the saliva is to lubricate the mass of food for deglutition, and to allow the tongue and muscles of the mouth to fit it into a bolus on which the process of comminution can better be effected, we have no doubt that the process of mastication is of vastly higher importance than it is *practically* judged to be. We are inclined to this opinion, which is common to most writers on digestion and dyspepsia, from various considerations; from the fact that most dyspeptics whom we have known, have been conscious of having suffered from this, either through habit or from imperfection of the teeth;—that every individual of observation must have noticed the disturbance of the digestive process after a hurried meal; and lastly, the experiments on St. Martin, which have the greatest interest, in demonstrating the necessity of perfect comminution. The reader is referred to the 1st and 34th Experiments of Dr. Beaumont's work, which seem abundantly to prove that food introduced into the stomach in an undivided state, is acted upon by the gastric juice only on the surface, becoming converted into chyme so slowly that it acts like an irritating foreign body in the stomach. The analogy before alluded to, between the gastric fluid and a chemical solvent, seems still more exemplified in this process. The finer the comminution, or the smaller the particles into which the food is divided, the larger surface will be presented to be acted upon, and the sooner the union or solution will be effected.

Beside the importance of slow and perfect mastication of the aliment as regards its comminution and admixture with the saliva, another decided benefit results from it in the comparatively little danger of eating to excess. Every one must, or may be conscious of this in his personal

experience; the rationale may not be quite so obvious. If, as seems probable, no gastric juice exists in the stomach in its empty or unirritated state, and this fluid is poured in to meet and as it were neutralize the aliment, perhaps it may be that this exact point of neutralization or combination is thus met by slow additions, whilst it would be exceeded by hasty supplies.

The difference between the inhabitants of this country and Europeans as to this item of domestic habits, has perhaps been more generally remarked upon by the traveller, than almost any other characteristic of private manners. The laborer of France, or Switzerland, or Italy for example, passes an hour over his dinner of bread and grapes and weak wine, interspersing his meagre repast with light and cheerful conversation, procrastinating the enjoyments of his humble and often inadequately satisfying meal to the utmost extent possible. The Yankee citizen, on the other hand, whatever his rank or employment, encounters his dinner as he would any other necessary work which had to be accomplished. He seats himself with a sober and determined resolution, as it were to a task, to which all his faculties are to be applied till it is completed, which probably occupies less time than the mere preparation of a salad would do the southern European. The comminution of the food will of course be dependent on its mode of preparation and the integrity of the dental organs. And as it is a fact which no foreigner fails to notice, that no people are so unfortunate as to the possession of good teeth, as the Americans, we feel that this point of perfect mastication should be especially urged in a treatise addressed to the New Englander. In respect to the extent of this evil and its presumed causes, we may again quote from the work of M. Volney.

“ Travellers are equally agreed on the frequency of defluxions on the gums, rottenness of the teeth and the premature loss of these valuable instruments of mastication. Of a hundred persons under thirty, it may be affirmed you will not find ten entirely unaffected in this respect. It is particularly lamentable to observe almost generally that handsome young women, from the age of fifteen to twenty, have their teeth disfigured with black spots, and frequently a great part of them gone. Opinions differ, even among medical men, respecting the cause of a complaint so universal: some will have it to be the use of salt meat, which is in fact universal and habitual;—others say it is to be ascribed to the use of tea and the abuse of sweet things. Dr. Kaln, the Swedish physician, by comparing the regimens of various nations and different classes of society, appears to me to have demonstrated that tea does not injure the

teeth, as a saccharine liquor, or as an infusion of an acrid plant, but as a *too hot* drink; and indeed it is known of old by experience, that every kind of liquor too hot, even hot soup, occasions a painful sensibility of the teeth, which manifests itself if they subsequently come in contact with anything cold. This is no doubt the reason why bad teeth are an universal complaint throughout the north of Europe, for in all cold countries, hot liquors impart an agreeable sensation to the palate, the stomach and the whole frame; while, on the contrary, cold drinks impart an agreeable sensation in hot countries, and it is remarkable that in these the teeth are very generally sound and white, as we see among the Negroes, Arabs, Hindoos, &c. A fact observed within these twenty years, in the United States, tends to corroborate this theory. Previous to that time, a savage with a bad state of teeth was never seen, and the food of the savages is commonly cold. A few individuals, particularly women, of the tribe of Oneidas, Senecas and Tuscaroras, who live within the precincts of the United States, having adopted the use of tea, their teeth, in less than three years, became, like those of the whites, disfigured with black spots and rottenness. Another fact, mentioned by the circumnavigator Bougainville, is perfectly analogous to this. He says that the wretched ichthyophagi of Terra del Fuego, the Pesbarays, have all bad teeth, and he adds that they live almost entirely on shell fish, not raw, but roasted and eaten *burning hot*."

The last considerable error in food which we shall mention, is too great a variety of alimentary substances taken into the stomach at the same time. The practice of the New England laborer is, however, less blameworthy than that of the *soi-disant* higher classes, in this particular; in general, there is here a commendable simplicity of diet and an unsophisticated mode of cooking. Although an occasional change of substances seems essential to the health of the human subject, as was observed when considering the experiments of Magendie, the mixture of various kinds of food, of different degrees of digestibility, in the stomach, is an error upon which all judicious dietetic writers accord, and all individual experience corroborates. The experiments on St. Martin offer, as it were, ocular demonstration that a number of articles of different kinds are digested much less speedily, and no doubt with much greater expenditure of the vital energies, than either of them separately. Apart from the direct agency thus produced in debilitating the stomach (which may be perhaps explained on the supposition that the gastric fluid exerts a kind of elective action upon those parts of the alimentary mass which are most comminuted or most easily combined with, leaving the others un-

touched to act as foreign bodies upon the delicate tissues of the organ), the inducement to overload the digestive apparatus is thus augmented.

The next subject which presents itself in considering the errors of diet, after those of food, are those of drink. Of these, one presents itself so prominently, and of consequence so vastly superior to all others of food and drink collectively, that a volume might be employed in discussing it. We need hardly mention that we refer to the use of stimulating drinks, the evils and injurious effects of which upon the physical system have been so amply developed, within a few years, and pressed upon public consideration with so much earnestness, talent, learning and effect, that the subject is well nigh exhausted, as it is well understood by all who are not wilfully blind to the truth. We shall dismiss the subject by observing that the effects on bodily health, from the use of alcoholic drinks, including under this term all those capable of producing undue stimulation, whether spirituous or distilled, and fermented, are, 1. To urge on the powers of life beyond their normal or healthy action; to drive on, as it were, the machinery of the animal system, whilst it is already going with rapidity enough; to expend, or rather to squander the excitability of the constitution, and consequently to leave the individual the sooner without the principle of life. 2. To act directly on the delicate textures of the stomach by their acrid and narcotic properties, disturbing the healthful functions, and, on continued repetition, the organic structures of that viscus.

The abuse of hot drinks is deserving of some attention. Amidst all the diversity and contrariety of opinion, upon the various topics of dietetics, on no point does a greater discrepancy obtain, than in regard to the use of tea and coffee, two articles of universal consumption in New England. One party have considered them as drugs of decided and injurious properties, exciting, as such, a narcotic, stimulating, and indirectly debilitating influence on the stomach and on the nervous and circulatory systems. Others, again, have regarded them as possessed of too slight medicinal properties to be worth regarding in our regimen. In this controversy, as in most others relative to subjects so little susceptible of anything like demonstrative evidence as that of dietetics, the truth no doubt lies in the middle. That they are not so deleterious as some imagine, the general good health of our and other communities in which they are so abundantly used, presents the highest evidence the point is capable of, that of experience;—on the other hand, there would seem to be presumption sufficient that they sometimes produce injury, in the instances which every medical man must have met with of a train of ano-

malous nervous symptoms ceasing upon these beverages being relinquished, as well as the effects which every observing individual must be conscious of, from undue indulgence in too large and too strong potations of them.

One view of this subject has, in the opinion of the writer, been too generally overlooked; a view which he believes to be pathologically the most important of any in connection with this topic. This is the indirect influence of these drinks, in their customary large quantities, throwing aside any specific effect, upon the cutaneous and pulmonary exhalants. The great proportion, the overwhelming majority, of the diseases of our climate, are those arising from obstructed perspiration, colds, catarrhal affections, &c.;—these form the first link in the chain of morbid actions of our most common and most fatal affections, phthisis, bronchitis, &c. The peculiar vacillating, changeable character of our climate, the immense and sudden variations of temperature, no doubt are decided agents in their causation. But are not the constitutions of New Englanders kept in an especial state of predisposition and liability to such affections by the over-action to which the most exterior of the secretory organs, the skin and lungs, are subjected, through the influence of too much nourishing and stimulating food, the surplus of which is thus to be disposed of, and by the quantities of warm drinks which are thus more speedily and more directly to be got out of the circulatory organs? The experiments of all physiologists have accorded in the fact that liquids are removed from the stomach almost immediately, even when its pyloric orifice has been closed by ligature;—so speedily, as long since to have formed the suggestion that some more direct rout must exist from the stomach to the urinary organs, than by fluids being absorbed into the sanguineous mass and separated by glandular excretion.

A portion of these unnecessary fluids is separated by the kidneys;—a portion, and that, under favorable circumstances, as external warmth, &c. no inconsiderable one, is habitually excreted by the cutaneous and pulmonary emunctories; enough, surely, to render their office too important to health to bear being checked without injury.

We believe that this is the rationale of the injury done to the health from the employment of tea and coffee, rather than their usually alleged narcotic, or debilitating, or over-diluent properties. We well know that the great outlet of human life amongst us, is from pulmonary diseases; if, then, there seems a strong probability that this is one even of the minor auxiliary causes of such diseases, it requires little argument to convince the candid mind of the expediency of a general reduction, or a total abandonment of a custom which is universally allowed to be unnecessary

to health, and assuredly of as little gratification to appetite as any practice which affords pleasure enough to become confirmed habit.

The considerations in relation to the effect of hot drinks in destroying the teeth, before adduced, form another dissuasive from their use.

The times of taking food, is a subject of really more importance than at first glance it might be deemed to be. Experience demonstrates that the perfection of the process of digestion will depend not only on the quantity and kind of aliment taken, but on the frequency of the repetitions in taking it, and upon its being preceded or followed by exercise or rest, and even on the hours of the day, independent of these circumstances.

The food is not duly disposed of when the stomach is kept in a state of repletion. Dr. Paris lays down the following corollary in relation to this subject ; “ that the several processes by which aliment is converted into blood cannot be simultaneously performed, without such an increased expenditure of vital energy as weak persons cannot without inconvenience sustain ; thus chylication would appear to require the quiescence of the stomach, and sanguification to be still more incompatible with the act of chymification.”*

It is certain that a healthful appetite does not recur until the portion of food last taken is not only removed from the stomach, but the ulterior processes of assimilation completed ; therefore the too frequent taking of food must prevent the return of that appetite, a certain degree of which is a most wholesome, perhaps an essential stimulus to digestion. In illustration of this principle of the connection between appetite and digestion, every practitioner must have observed that the indulgence of a patient in sickness in some kind of aliment for which a strong propensity is manifested, however improper it might *a priori* be deemed, is rarely attended with ill effects.

There is in many of the animal functions a natural periodicity of action, as in sleep and waking, some secretions and excretions, which undoubtedly exists as to hunger and thirst and the digestive function. The observation of different nations shows that comparatively slight deviations exist as to their customs in the number of times of taking food per diem. The necessities of certain savage tribes occasionally compel them to abstain from food a number of days in succession, and then without injury they are known to devour as much as would have been taken through the time of fasting ; and again, the pampered and luxurious high livers

* Paris on Diet, p. 54.

may inflict upon their stomachs, to their ultimate utter ruin, four or five meals daily. These are the extremes. The bulk of men, in all ages and all countries, have found the taking of food twice or three times per diem the most expedient system. We have no disposition to combat the conclusion which experience, the last and best argument in medicine, seems thus to have set down.

History, indeed, shows us instances of nations whose customs were in this respect those of monophagism, or eating only once in the day. Cyrus, according to Zenophon, eat only once in the twenty-four hours, and established this habit amongst the Persians. The ancient Greeks, also, followed this custom. Plato regarded eating more than once a day as very injurious to health of body and serenity of mind. "*Vidi monstrum in naturâ,*" says he, "*hominem bis saturatum in die.*"*

In New England, it is hardly necessary to observe, the general habit is, and always has been, the taking of food three times daily; and as to the period of taking the principal meal, their practice, at least among the laboring classes, has agreed in that hour, meridian, which most writers, European and domestic, have considered as the most appropriate and advantageous. There seems to be no doubt, whatever may be the reason, that the functions of the stomach are much more energetic during the early part of the day, than towards evening. Dr. Knox,† of Edinburgh, cites, in corroboration of this fact, "the opinions of those whose profession it is to train men to the performance of great feats of muscular strength, which, when they speak the truth, is of much more consequence than that of any medical man." Experience has taught them that during *training*, the object of which is to enable the human frame to acquire the utmost degree of vigor consistent with health, the evening is not the proper time for the digestion of food.

The rule which universal experience, and the general testimony of writers (for it would be hopeless to expect any universal accordance of opinion on any subject relating to diet, amongst them), establishes, is, that whilst the system is in a state of fatigue, the functions of the stomach are not duly performed. Towards night, the laboring man, especially with the habits of activity and industry so general in New England, will feel a degree of bodily exhaustion which extends through the digestive organs, as well as the rest of the machine, and which will therefore not

* The reader who is interested in the historical research of this subject, is referred to the article *Repas*, in the *Dict. des Sciences Medicales*.

† See his observations on the diurnal revolutions of the pulse, republished in the *N. E. Journal of Med. and Surg.* Vol. V. p. 51 et seq.

be restored and recruited by the ingestion of much or nourishing food. Sleep is the natural and appropriate mean of reaccumulating, so to speak, that amount of vital energy which is requisite to carry on the movements of the animal machinery. The custom in New England was, formerly, as has been before observed, for the laboring man to take a moderate meal only, towards evening, and that without animal food. This still prevails in a good degree, though it has become a custom worthy of being reformed, to use more meat, hot tea, &c. at this meal, than is expedient.

In a treatise on diet adapted to the sedentary, the luxurious and the valetudinarian, the subject of exercise would form a principal and most important topic of consideration. In the healthy life of the laborer in New England, there seems to be no occasion to urge anything respecting this upon him. On the one hand, the habits of industry, here universally inculcated from childhood by parental precept and example, thus made universal custom, and the honest stimulus of expected independence, form the surest safeguard against his suffering from want of exercise; whilst, on the other, no fear of want, either for himself or those depending on him for support, need drive him to that over-exertion which might produce, as we know it does in Europe, disease, premature old age, and death.

In the works on dietetics, a vast amount has been written upon the relative healthfulness or injurious qualities of the various articles of the *materia alimentaria*, or substances employed for food. Indeed the whole burden of a majority of our books is upon this point, and it would be a subject of amusing investigation to examine the discrepancies of the various writers, as to the character of almost every article of food. In looking at their dogmatic and positive recommendations and denunciations to the dyspeptic and the invalid, the shrewd remark of Van Swieten* occurs as appropriate:—"Nullum alimentum universali titulo salubre dici potest, et qui rogat quoddam est salubre alimentum, idem facit ac si quereret quisnam sit ventus secundus, non cognito itinere."

To the healthy, the vigorous and the robust, such as we know is the New England laborer, the attempt to specify certain articles of food as wholesome or the reverse, would be still more idle and absurd. Keeping in view, what we have given as in our view the grand standing rule of diet, that of limiting the quantity of food to the least that will keep up the forces of the system (which, there is no doubt, is much below what

* *In Aphorism Boerhaave, tom. 1, p. 68.*

is now usually consumed), we might modify the text of the apostle, and well apply it to those who are the subject of our essay—to the healthy, all things are healthy.

Having thus reviewed what seem to us the principal errors which need correcting in the food of the New England laborer, it seems but reasonable that some explanation should be attempted of the fact, which has been before stated, that he is now pre-eminent in health and bodily capability. This, it is believed, is ascribable :

1. To his always having an abundant supply of nourishing and wholesome food.

2. To the simplicity of cookery customary with him.

3. To his industrious habits of labor, which prevent the effects of over-feeding from being so manifest or injurious as they would be under other circumstances, and as they are to all other classes—as, for example, the professional and mercantile, who feed like the laborer, but do not take his active exercise.

4. To his intellectual and moral habits being such as to stimulate him to, and sustain him under active and constant labor, and keep up a tone of cheerfulness and constant prospect of improvement in his comforts and situation; a state which is wonderfully adapted to sustain a healthful condition of the digestive function, which is so eminently connected with the disposition and temper of mind, both as a cause and consequence, in their mutual integrity and derangements.

In closing this part of our subject, we would urge upon the intelligent, well-informed and independent working man, that the golden rule which will best secure him bodily health and strength, as well as mental serenity, as far as this is dependent on physical agents, is that of *strict temperance*; that is, a moderate use of things pleasant and useful to his body, and a total abandonment of such as experience has proved to be unnecessary and noxious.

Conclusions.

1. A diet of *both* animal and vegetable food is adapted to the condition of the New England laborer.

2. No grand errors exist in his present system of diet, and no radical change is demanded to ensure a greater amount of health and strength, though many minor, but still important, errors exist.

3. The proportion of animal food usually customary is too great, and a considerable reduction would be expedient and advantageous, though it is impracticable to make a precise statement of the extent to which this

is required, which must depend upon circumstances, as amount of labor performed, climate, season, bodily constitution, habits of life, &c. A general statement of this fact can alone be made.

4. The amount of food in general, customarily used, is more than is necessary for the maximum of health and strength, though a more specific statement of this abuse is also impossible. It must be left for each individual to attempt to reduce his quantity of food to that point at which he finds his mental and bodily powers most energetic. In searching for this point, the New Englander may be almost certain that he must look for it in a descending ratio.

5. The great principle in regulating diet is to regard quantity rather than kind.

6. Perfect mastication and slow deglutition are important auxiliaries to the proper digestion of food.

7. A great variety of alimentary substances taken into the stomach at once, are calculated to do injury on several accounts.

8. The employment of alcoholic stimulants, and hot aqueous drinks, is deleterious to the functions of the stomach and to the general health.

9. The times of taking food, the state of the mental and moral functions, the quantity and times of exercise, &c. are all subjects of importance in the general subject of dietetics ;—in these particulars, the habits of the New England laborer do not vary much from a healthful standard.

FINIS.

The premium having been awarded to the preceding dissertation, it becomes necessary to publish the following resolutions.

“ By an order adopted in the year 1826, the Secretary was directed to publish annually the following votes, viz. :

‘ 1st. That the Board do not consider themselves as approving the doctrines contained in any of the dissertations to which the premiums may be adjudged.

‘ 2d. That in case of the publication of a successful dissertation, the author be considered as bound to print the above vote therewith.’ ”

